A review of the assessment of the effects of protection in MPAs: current knowledge and gaps

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Assessing the effects of marine protected areas (MPAs) in relation to conserving coastal marine environments requires appropriate parameters to be estimated analysed and interpreted within a logical and statistically valid framework. We report a quantitative analyse of the literature concerning studies that evaluate the MPAs effectiveness. Our aim was to quantify the frequency of most common methodological approaches and statistical analysis, most used response variables, to consider the types of information generated and to detect areas in which further research is required. This paper synthesises the most common study subjects, identifies the methodologies and the parameters that have been used to evaluate the effectiveness of MPAs. We reviewed 220 references of studies carried out in different MPAs from the Mediterranean Sea, the Atlantic, Pacific and Indian oceans, since 1983 to 2006. Publications before 1996 were predominantly peer-reviewed, although non-peer reviewed literature appears since 1989, mostly as technical reports. Most studies focused on biological parameters such as effects on populations, effects on assemblages, effects on the habitats and effects on the fishing yield; by comparison, there were few socioeconomic studies. Other results show that most of the studies developed a C vs I sampling design. Peer-reviewed showed more complex sampling designs than non-peer studies. The results suggest that standardized methods of study, to be applied by both researchers and administrators, enabling comparable results to be obtained, are required for a reasoned management of MPAs.